

Joint Experiment In Expeditionary Force

The basic idea was for the warfighters to go forward, even as battle area intelligence was beamed back to the rear--and then on to the warfighters.

By William H. McMichael

Two F-15C fighters roared over Langley AFB, Va., slicing through the heat of a Virginia day as they practiced basic flight maneuvers. Down below, inside a nondescript auditorium-sized building not far from the base's La Salle Gate, hundreds of airmen and civilians peered at computer screens, chattered among themselves, and tapped out messages to distant bases.

The work of those on the ground may not have been as exciting as the action high overhead, but it was far from mundane. It was all part of an ambitious experiment that employed electronic pipelines and satellite links to streamline

the way that USAF warfighters get intelligence, weather, and targeting information when they deploy to the world's hot spots.

The activity inside the Operations Support Center and at outposts in Florida, Idaho, and Nevada formed the backbone of Joint Expeditionary Force Experiment 99, held last year. It was the second in a series of experiments expected to continue through 2010. This was a joint service experiment. The goal is further improvement in the way the Air Force and other services react and deploy when trouble strikes.

The basic idea is to send fighters, bombers, and tankers forward, even as drone aircraft and satellites over the trouble spot beam up-to-the-minute intelligence back to the rear. That intelligence is analyzed, turned into target lists, and then transmitted forward to the warfighters, who get their orders on the move. At the same time, their support web manages the battle from the rear, keeping the forward presence light, nimble, and flexible.

The Battle Starts

JEFX 99 put this strategy to the test in a mock

operation that spanned the United States. Reacting to an emerging military threat in a notional "foreign" trouble spot (the actual location was on the Nevada-California border), an Aerospace Expeditionary Force--some of it flying live out of Nellis AFB, Nev., and some of it virtual, created on a simulator in New Mexico--was deployed to the "theater." As during EFX 98, the AEF was directed from a Combined Aerospace Operations Center at Hurlburt Field, Fla., and backed by air battle managers working out of Langley. All told, some 4,000 airmen and civilians scattered around 10 locations took part in JEFX.

The scenario also included Army and Marine Corps ground assets, Navy jets, and a command-and-control ship. Allied officers also took part in the two-week effort. The deputy Joint Force Air Component Commander was a three-star German air force general who was linked to JEFX activities from his post at Ramstein AB, Germany. All of the activity was observed and scrutinized by personnel from US Joint Forces Command, DoD's new lead operational player in

the joint world. (See box, p. 50.)

Planners made two large assumptions in JEFX: that they had the ability to see the battlespace clearly and could decide, in real time, what effect a given weapon or event would have on the battlespace. The Air Force doesn't have those capabilities today, but work goes on.

Already, the experiments have produced some exciting results. For example, the Air Force during Operation Allied Force received fresh intelligence that detailed changed enemy positions. This information was analyzed and forwarded to a B-1 bomber crew already airborne, allowing the crew to hit a new target. The Multi-Source Tactical System that made it happen was developed during EFX 98.

"We were able to give real-time information to the aircrew en route, information about the threat changes which had occurred since their takeoff," said Maj. Gen. Gerald F. Perryman Jr., commander of the Aerospace Command and Control and Intelligence, Surveillance, and Reconnaissance Center at Langley and the officer

charged with implementing Air Force experimentation programs. "We could give them imagery, we could give them a picture of the target we wanted, we could change their target, we could give them two-way e-mail with command centers. That's an exciting development."

That advance was refined during JEFX 99. In one JEFX scenario, operators were able to retask and retarget an in-flight B-52 only 35 minutes after new intelligence was received. The data was programmed directly into the bomber's cruise missiles via satellite link, Perryman said.

"This is something that airmen have sought for decades," Perryman said, "and we're working on it full bore."

Less dramatic advances have emerged. The Air Force tested 59 separate initiatives during JEFX 99. One of these, the Theater Battle Management Core System, is expected to appear in the tool kits of warfighting commanders early this year. TBMCS, a complex combination of hardware and software products, promises to streamline the flow of data to a Joint Force Air Component Commander

and quicken the decision-making cycle.

Perryman called JEFX 99 "a resounding success." The Air Force hopes the lessons learned will help its deployed forces get where they're going more quickly and with less support than ever. It's become a common aim of all the service branches, a move driven to some extent by slack budgets. The Air Force wants its AEFs to be "light, lean, and lethal" and says JEFX will take it there.

Revolution, Evolution

JEFX has been advertised as a series of "revolutionary experiments," in the words of one brochure. And everyone involved in the experiments likes to toss around the names of aviation pioneers such as Billy Mitchell and Jimmy Doolittle. However, the Air Force cautions against taking this claim too literally. The program remains largely incremental, an extension of current systems and procedures.

Air Force Maj. Gen. Timothy A. Peppe heads the joint experimentation directorate of US Joint Forces Command. Peppe thus leads the development of joint operational

concepts. He said anything revolutionary goes against the culture of the military.

"Most of us are very comfortable working the here and the now, and I daresay that most of us are probably not really good at looking 10 or 15 years into the future," Peppe observed. "I'd say we're really good at making some evolutionary steps and improvements in our capabilities, but I'm not sure how revolutionary we are."

He gets no argument from USAF Lt. Gen. Lansford E. Trapp Jr., who now is vice commander of Pacific Air Forces but served as the Joint Force Air Component Commander in the first EFX iteration.

"We all come into these darn things hidebound by the procedures and everything you've learned," Trapp said, "and when you sit down with a group of people and say, 'Hey, look, throw all that away and figure out a better way' to do, in this case, dynamic battle control, there's some resistance to that, initially, because everybody comes in with these preconceived notions."

And, of course, no one wants to fail.

"We're measured by success," Peppe said. "I think what we all have to come to grips with is, if you're really going to experiment with some stuff, you're going to fail every now and then. And maybe you fail more often than you succeed. But if you go back and look at some of the previous stuff that was done in the interwar years, we're going to have to learn to accept some failures and not as much progress."

"We have some folks that, ... if they give you a buck, they want a 'deliverable,' " Peppe said. "If you're going to look to the future and try some things that are really outside-the-box thinking, you're not always going to get that deliverable. And that's hard for some people to realize."

Laser Targeting

At JEFX 99, revolution was reserved for a category of initiatives that don't have current applications but looked too interesting not to explore. One of these was a Space Based Laser targeting system simulator set up at Langley.

On a computer screen showing a map of the Korean peninsula, simulated North Korean

missile launches appeared as colored blips. An operator could identify the location, current altitude, projected target site, and the time remaining to shoot it down in its boost phase.

"This is more of a 'what-if,' " said Bob Grueneberg of the Air Force SBL Office. "The problem with simulators," he joked, "is that they're doomed to succeed." The system, an element of 1980s Strategic Defense Initiative research, is scheduled to be operative in 2020, according to SBL's Capt. Eric Kolb.

True risk-it-all experimentation also faces serious budget constraints. Congress seems committed to the concept, having in 1998 formally handed responsibility for joint experimentation to what is now Joint Forces Command. On the other hand, nearly all of the money for Pentagon experimentation rests in the hands of the services. "We're publishing that we've got about nine concepts," Joint Forces Command's Peppe said, "but we're really only working about four or five, because of resources."

The services are wrestling with how to best allocate their scarce resources. "Do

you fund these things and do an experiment and you find out great things, but then you have to wait another two years or so before you get it into the normal budget process?" asked Gen. Lester L. Lyles, vice chief of staff of the Air Force. "It almost means that we have to look at and find ways that we can more quickly evolve, find revolutionary steps or experiments on how we can do our normal budgeting and programming process to match with the lessons learned from these experiments.

"Right now, we haven't completely broken the code on how to do that."

Still, senior USAF leaders have said they are deeply committed to experimentation and are pleased with what EFX has produced to help speed deployment and operations of its expeditionary forces.

Asked to tout the successes of JEFX 99, senior officials invariably lump it together with the 1998 experiment, indicating that they want the Air Force effort to map its future to be considered as a continuum rather than each year as an end in itself. That said, they invariably point with pride to the

advances made on TBMCS.

TBMCS is slated to replace CTAPS, the Contingency Theater Automated Planning System, according to Perryman. To better deploy contingency forces-to give an airborne JFACC the smoothest possible link to all forces to execute the upcoming battle-TBMCS is a must.

TBMCS is a key to what the Air Force calls dynamic battle control--the ability to acquire a near-instantaneous picture of the battlespace, quickly react with a force tailored for the specific mission, and rapidly gain a tactical advantage.

Getting Dynamic

Today, dynamic battle control comes in dribs and drabs--the B-1 retargeting, for example. Currently, said Trapp, "We take a look at what the battlespace is 48 hours from now. And we allocate resources against designated sets of targets. And then we prosecute those in a time-phased manner through this thing called the Air Tasking Order. And then we assess what impact that had, and we start the cycle over again. And they overlap with one another, as you

know. That's not very dynamic."

Compare that to the Kosovo retargeting, accomplished, officials said, in 20 to 40 minutes.

"We didn't do that on a routine basis," Trapp said. "Don't get me wrong, here. But we did that a number of times. And that's getting pretty near real time. Beats the hell out of 48 hours. And, in a couple of instances, we were able to find significant military targets and strike 'em in that time frame, and it made a difference."

The Air Force wants dynamic battle control over the entire spectrum of operations-and to provide it to an airborne JFACC as well as a land-based commander.

A JFACC looking to gain a modicum of such control must now rely on CTAPS. And as Perryman pointed out, "It just doesn't interoperate as well with the other services. It's more cumbersome. You can't keep up with things in a dynamic way."

JEFX 99 taught the Air Force that TBMCS, despite its promise, needs to be scaled back. The Air Force tried to make TBMCS a one-size-fits-all operation, "the system of systems,"

Trapp termed it. "What we found is that some of the systems are easier done and more easily understood if we just make them Web-based."

Imagery and messaging systems are two such areas, he said.

"There are pieces of TBMCS that work wonderfully," said Trapp. "The module that generates much of the ATO work is just slicker than can be. [It's] Y2K compliant. There's an open architecture. But it's not Web-based, it's Unix-based. So as a result, it takes a lot of training."

Those tweaks aside, JEFX has convinced the Air Force that TBMCS is the way to go--at the joint as well as Air Force level.

During JEFX 99, the Army battle control element at the Combined Aerospace Operations Center at Hurlburt Field was able to flow the targets it wanted the Air Force to strike directly into TBMCS, according to Perryman. In other words, TBMCS and the Army's Battle Command System were able to talk with each other, allowing for a broader shared picture of the battlespace.

What Perryman called a successful development test and evaluation on TBMCS is being followed by a full multiservice operational test and evaluation in January. That test will include an electronic liaison with a Navy command-and-control ship, he said.

Several other JEFX products showed similar promise. Perryman touted "the ability to use distributive and collaborative operations so that the JFACC can get the right information about space-based activity and get a better link to the tanker airlift coordination center at Scott [AFB, Ill.]. Those are huge."

Langley's Operations Support Center successfully delivered an electronic ATO to a command center in Korea and did so on another occasion to USS Coronado. "It was a smaller version of a full-up ATO," Perryman said, "but we were able to push an ATO to them, which those forces in those locations could have used."

Everyday Use

Until such processes and systems are employed on an everyday basis--until they allow commanders to develop enough confidence

in them to feel comfortable relying on a smaller footprint in the forward area, and on the concept of reaching back for the support and information they need--near-term expeditionary forces will probably carry Desert Storm-sized support elements forward, should war break out.

"There's a debate on that," Trapp said. "If we had to go to a major theater war today, I think we would take all of our large footprint forward to do the command and control. We just demonstrated that in Kosovo. We ended up with, I think, 1,500 to 1,800 people at Vicenza [Italy]."

Why? "Because we are not confident enough yet that we can do what we think we need to do through reachback," Trapp said. "We've only experimented with it twice. I mean, when lives are at risk, you tend to be a hell of a lot more conservative."

Lyles said he agreed with that "to some extent" but said that in Kosovo, the Air Force "learned lessons again about the benefit of having ... light and lean, plus lethal, capabilities. Perhaps there's some specific products that are not mature enough for us

to take. But some of the general concepts and the whole reachback aspect we demonstrated and used very well in Allied Force, and, I think, depending on the specific scenario, you will see a lot of us leaning towards trying to encompass some of those in another Desert Storm, if we had to."

Air Force officials agree that in the not-too-distant future, they'll have to break out of the Desert Storm-Kosovo mold. "You know, at some point in time, you'll always have to go out and play with the real thing," Peppe said. "Because models can't do everything for you."

In 1995-96, the Air Force sent three specially created AEFs to Bahrain, Jordan, and Qatar, part of a Pentagon strategy of using AEFs to fill the gap between Navy carrier deployments to the Middle East. The composite units were to help patrol the no-fly zones over Iraq, train with coalition partners, and practice rapid deployment.

The deployments took the AEFs to unimproved airfields, making them a fit test for the concept. Similar deployments, officials say, may be the next logical step to take in deploying expeditionary

forces that truly are, as Lyles terms it, "lean, light, and lethal."

Confidence Building

Trapp agreed. "I think that that's what it's going to take," he said. "We've got to get it off the experiment mode into the exercise mode. We've got to actually go do it for real a couple of times before people get ... confidence and say, 'This is how we're going to go forth.'"

"We will be seeing more things like that," Lyles said. "We may have to find ways that we can do some of these things in a sort of real-world contingency, if you will."

Unless those exercises are conducted in tandem with a no-fly zone mission, they may have to come out of some other program's hide. The Air Force spent more than \$40 million on EFX 98 and more than \$60 million on JEFX 99. Live AEF tests would certainly require even more.

"The US Army has set aside a large pool of money, a relatively large pool of money, so that they can take advantage very quickly of lessons learned from experiments," Lyles said. "We and the Navy and others are looking at whether or not we want to

try to adapt the same technique or whether there is some other way that we can do it."

The Air Force also will cut back on the number of large-scale experiments following JEFX 2000. "What we'd like to see is smaller-scale experiments throughout the year, as well as a larger-scale, integrated experiment conducted in concert with the Joint Forces Command that will be done every other year, on even-numbered years," Perryman said.

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